



**3DEXPERIENCE**

# DESIGNER TO ANALYST PROCESS SOLUTIONS

Innovate. Evaluate. Validate.



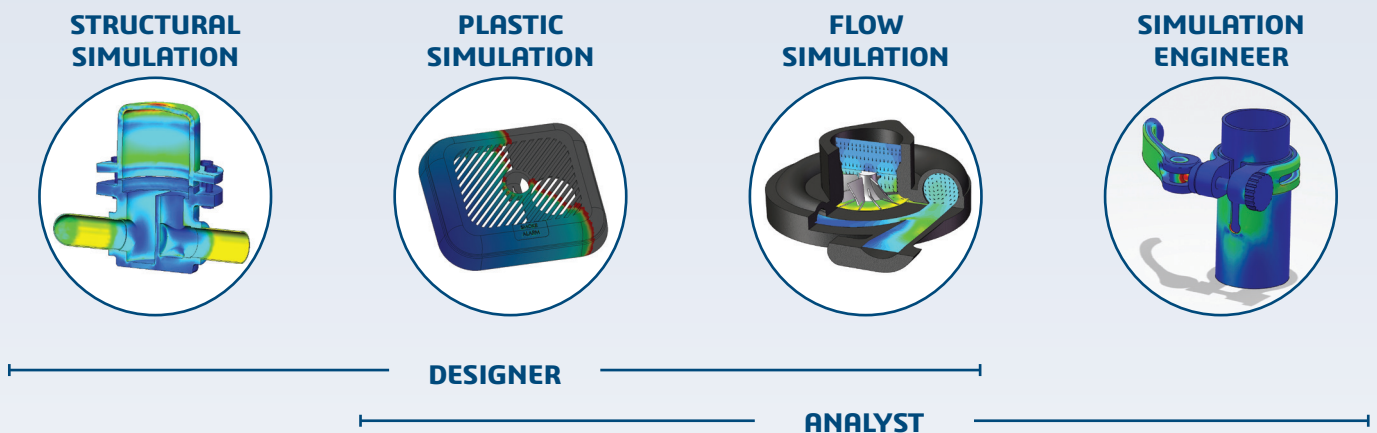
# INNOVATION BY SIMULATION-DRIVEN DESIGN

Innovation starts with someone asking, “What if?” or “Why not?” Answering these questions with any great certainty typically requires the time and expense of physical prototyping and testing. But this can stifle innovation under the weight of an organization’s cost constraints.

So, we asked, “What if many of the questions that arise from the painstaking process of designing, testing, refining, and testing again, could be answered before any metal was cut or wiring installed?” The result is SOLIDWORKS® Simulation, a dramatic transformation of the design process, where easy-to-use, yet powerful analysis tools can be employed every step of the way.

SOLIDWORKS Simulation provides testing and analysis of parts and products in real-world environments in advance of any manufacturing work. Teams can work concurrently to develop the design while validating any changes, thus speeding up the design cycle. SOLIDWORKS Simulation also retains previous analyses and data so that any design changes throughout a product’s life can be quickly and easily recalculated ensuring product performance and reliability.

As the SOLIDWORKS model is the information master at the center of the design process, the model holds companies’ analysis setup and results, meaning that any changes of a design throughout its lifecycle can be quickly and easily recalculated, ensuring product performance and reliability. Thousands of companies have taken advantage of these tools, helping many to become leaders in their markets.



SOLIDWORKS Simulation tools deliver actionable results for both the casual designer or engineer as well as the dedicated analyst. They provide a completely integrated design-and-analysis strategy, without ever having to leave the familiar SOLIDWORKS environment. Other benefits include:

## CONCEPT DESIGN SELECTION

- Ensure assembly layout movement range and capability with Sketch Motion.
- Test early (incomplete) assemblies using connectors to mimic standard parts.
- Allow for rapid design iteration using fast solvers to guide design direction.

## PRODUCT DESIGN REFINEMENT

- Determine operational loads and timing with Motion Analysis.
- Evaluate alternative assembly methods.
- Calculate Factor of Safety (FoS) and product performance.
- Measure flow rates and the impact of fluid flow on your designs with Flow Simulation.
- Alter your design automatically for optimal strength and stiffness.
- Evaluate the impact of complex material definition with Simulation Engineer.

## FINAL DESIGN VALIDATION

- Test structural performance under extreme and dynamic loading.
- Perform a multi-physics test that links fluid, thermal and motion analysis to a structural test to determine their impact on structural performance.
- Run a fatigue analysis to ensure product longevity.





# STRUCTURAL ANALYSIS FOR DESIGN

## **STREAMLINE DESIGN FOR STRUCTURAL STRENGTH, STIFFNESS AND ENDURANCE.**

Ensuring the required structural strength, rigidity, and endurance of a design has traditionally been in the realm of either physical testing or of specialist analysis tools. SOLIDWORKS Simulation delivers powerful analysis capabilities together with the SOLIDWORKS ease of use, resulting in a suite of structural analysis tools that can be used by both the designer and analyst.

SOLIDWORKS Simulation can assist in determining a product's capacity in the face of several factors:

- Motion
- Linear
- Frequency
- Fatigue
- Thermal Structural
- Optimization
- Non-Linear
- Dynamic

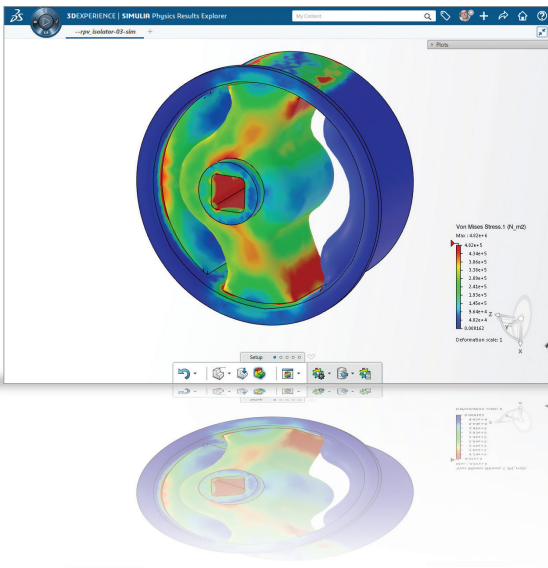
## **SIMULIA SIMULATION ENGINEER**

Understanding product performance under extreme loading and deformation requires a robust non-linear solution. Simulation Engineer enables analysts to tackle the most challenging of static non-linear problems using:

- Abaqus solver
- Advanced meshing
- Comprehensive material models
- Robust component contact formulation

**"The power of the Simulation Engineer product is the ability to come up with solutions rapidly and reliably to complex problems that become part of the design process."**

— Laurence Marks, Director Strategic Simulation & Analysis



## SOLIDWORKS FLOW SIMULATION

### Advanced fluid flow simulation made easy

Understanding the impact of fluid flow in and around your design can be key to evaluating its performance. Consider these design elements:

- Internal external liquid and gas flow
- Free surface flow
- Non-Newtonian flows
- Low speed to supersonic flows
- Fans and rotating components
- Conjugate heat transfer
- Electronics cooling module
- Pressure and temperature transfer to SOLIDWORKS Simulation for structural analysis

## SOLIDWORKS PLASTICS

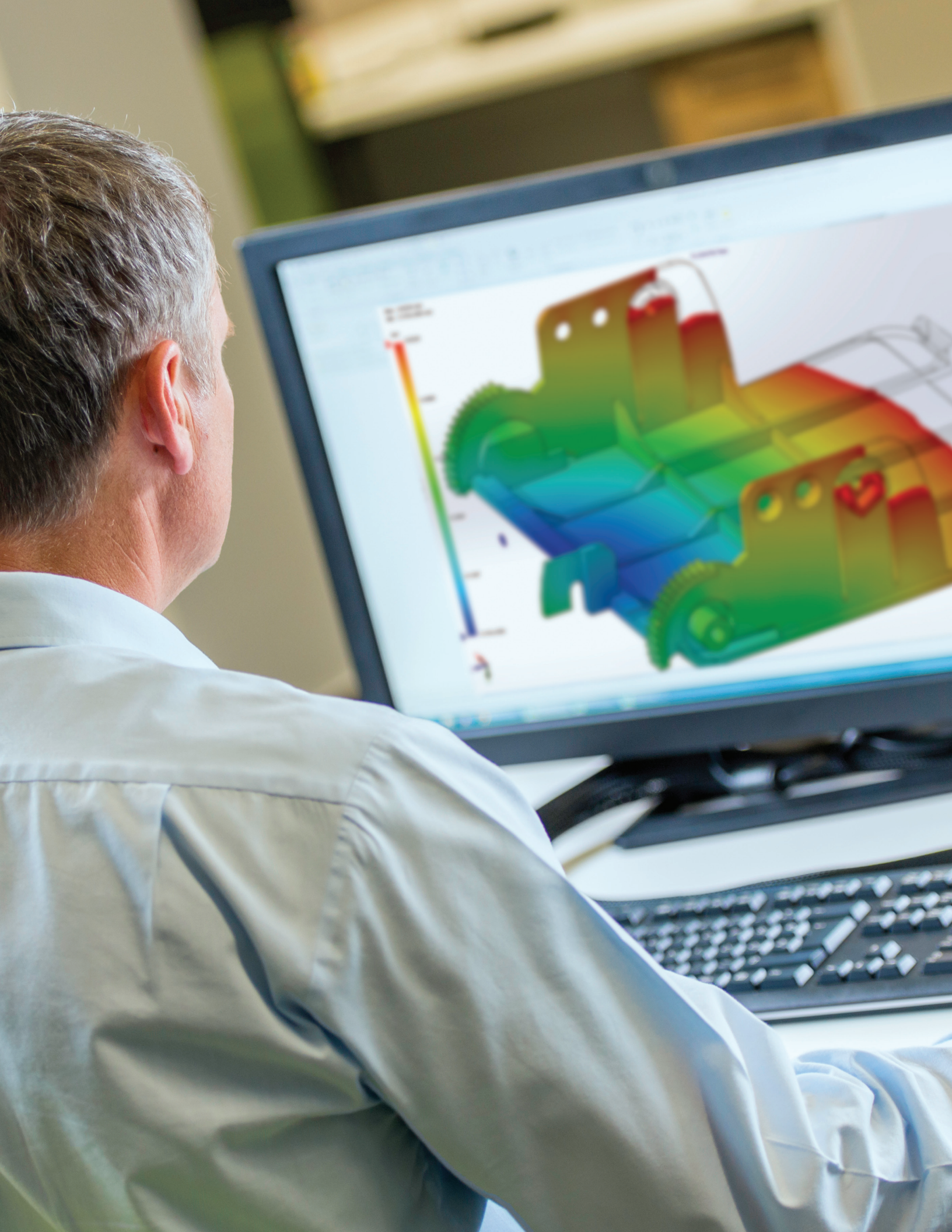
The design of plastic components cannot be complete without an analysis of their manufacturing process and the level of mold performance. SOLIDWORKS Plastics Simulation enables designers and analysts to simulate the plastic injection molding process, including:

- Confidence of component fill
- Component wall thickness and rib placement evaluation
- Weld line visualization
- Optimize injection gate location
- Visualize the plastic flow front and check if the part will fill the mold completely
- Determine maximum injection pressure needed to fill the mold
- Optimize gate locations to avoid or at least minimize weld lines



**See the full range of SOLIDWORKS software for design, simulation, technical communication, and data management at [www.solidworks.com/products2018](http://www.solidworks.com/products2018). To learn more about SOLIDWORKS, visit [www.solidworks.com/solutions](http://www.solidworks.com/solutions).**







# SOLIDWORKS PRODUCT DEVELOPMENT SOLUTIONS

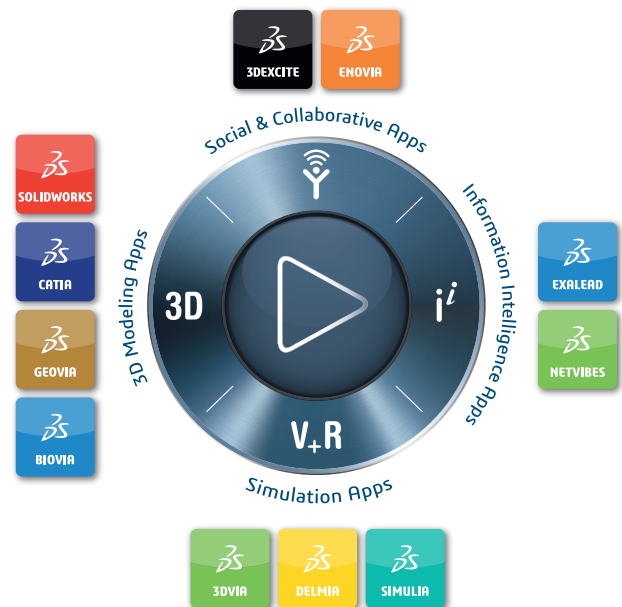
SOLIDWORKS software provides users with intuitive 3D development environments that help maximize the productivity of your design and engineering resources to create better products faster and more cost-effectively.

SOLIDWORKS Simulation comes in several different packages, depending on whether the user is a designer, an analyst, or both.

	SIMULATION STANDARD	SIMULATION PROFESSIONAL	SIMULATION PREMIUM	SIMULATION ENGINEER	FLOW SIMULATION	SOLIDWORKS PLASTICS
Design for Strength	▶	▶	▶	▶		
Thermal Analysis		▶	▶	▶		
Design for Endurance (high cycle fatigue)		▶	▶			
Easy multi-physics		▶	▶	▶		
Non-Linear Analysis			▶	▶		
Dynamic Analysis			▶			
Multi-Scale, Non-Linear				▶		
Large displacement contact problems				▶		
Complex material problems				▶		
High and Low Speed fluid flow					▶	
Internal and External fluid flow					▶	
Conjugate heat transfer		▶	▶		▶	
Mixing flows					▶	
Plastic part validation						▶
Mold design validation						▶

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